

Havant Thicket Reservoir Project

Environmental Statement Volume 4 - Appendices

Appendix A16 Effect on Climate

A16.1 Carbon Model

Portsmouth Water Ltd.

08/09/20

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Document history

PW Revision	Status	Purpose description	Originated	Checked	Reviewed	Authorised	Date
C01	B1	Final	AG	CB	LJB	LJB	08/09/20

Client signoff

Client	Portsmouth Water Ltd.
Project	Havant Thicket Reservoir Project
Job number	5169117
Client signature / date	

Appendix A16.1 Carbon Model

Project Name: Havant Thicket

Print Date: 31/07/2020

Produced By: Divya Deepankar, Rujavi Dave

Project Notes: None

Name	Quantity	kgCO ₂ e		
		Single	Total	Project
 Havant Thicket				
 Reservoir		172,987,403	172,987,403	172,987,403
 Product Stage (A1-3)		125,995,384	125,995,384	125,995,384
 Embankment		119,448,321	119,448,321	119,448,321
 Clay	4,466,678,111 kg	0.02	107,200,275	107,200,275
 Soil - General (Rammed Soil)		0.02	0.02	107,200,275
 Top Soil	74,752,136.16 kg	0.02	1,794,051	1,794,051
 Soil - General (Rammed Soil)		0.02	0.02	1,794,051
 Sand	183,057,500 kg	< 0.01	902,473	902,473
 Aggregates and Sand - Virgin - General		< 0.01	< 0.01	902,473
 Gravel	168,936,800 kg	0.01	878,471	878,471
 Aggregate - General		0.01	0.01	878,471
 Rock: hard limestone	87,127,600 kg	0.09	7,841,484	7,841,484
 Limestone - General		0.09	0.09	7,841,484
 Polypropylene (Plastic)	415,783.2 kg	2.0	831,566	831,566
 Polypropylene (PP)		2.0	2.0	831,566
 Wetland		3,883,012	3,883,012	3,883,012
 Clay	131,670,000 kg	0.02	3,160,080	3,160,080
 Soil - General (Rammed Soil)		0.02	0.02	3,160,080

Name	Quantity	kgCO ₂ e		
		Single	Total	Project
 Topsoil	12,265,500 kg	0.02	294,372	294,372
 Soil - General (Rammed Soil)		0.02	0.02	294,372
 Rock	4,264,000 kg	0.09	383,760	383,760
 Limestone - General		0.09	0.09	383,760
 Polypropylene (plastic)	22,400 kg	2.0	44,800	44,800
 Polypropylene (PP)		2.0	2.0	44,800
 Structures and pipes		2,393,238	2,393,238	2,393,238
 Reservoir Structure		2,154,949	2,154,949	2,154,949
 Concrete: Culvert under embankment (for 1:7 slope)	18,878,400 kg	0.10	1,944,475	1,944,475
 Concrete - General		0.10	0.10	1,944,475
 Concrete: Valve access shaft	600,000 kg	0.10	61,800	61,800
 Concrete - General		0.10	0.10	61,800
 Concrete: Control House (Option 3)	1,317,600 kg	0.10	135,713	135,713
 Concrete - General		0.10	0.10	135,713
 Concrete: Spillway	125,832 kg	0.10	12,961	12,961
 Concrete - General		0.10	0.10	12,961
 Pipes		238,290	238,290	238,290
 Ductile Iron	117,384 kg	2.0	238,290	238,290
 Iron - General		2.0	2.0	238,290
 Access road		270,813	270,813	270,813
 North Access		97,498	97,498	97,498
 Asphalt	4,197 m2	14	59,597	59,597
 Asphalt - 3% Bitumen Binder		14	14	59,597

Name	Quantity	kgCO ₂ e		
		Single	Total	Project
 Granular fill	7,288,500 kg	0.01	37,900	37,900
 Aggregate - General		0.01	0.01	37,900
 Car Park		60,584	60,584	60,584
 Granular fill	3,873,600 kg	0.01	20,143	20,143
 Aggregate - General		0.01	0.01	20,143
 Asphalt	2,848 m2	14	40,442	40,442
 Asphalt - 3% Bitumen Binder		14	14	40,442
 South Access		112,731	112,731	112,731
 Asphalt	6,175 m2	14	87,685	87,685
 Asphalt - 3% Bitumen Binder		14	14	87,685
 Granular fill	4,816,500 kg	0.01	25,046	25,046
 Aggregate - General		0.01	0.01	25,046
 Transport (A4)		46,863,306	46,863,306	46,863,306
 Wetland		41,724	41,724	41,724
 Material transport	428,640 tkm	0.10	41,724	41,724
 Road Freight: Articulated HGV. Unknown size. 50% Load		0.10	0.10	41,724
 Structures and Pipes		204,796	204,796	204,796
 Concrete transport		203,653	203,653	203,653
 Concrete transport	2,092,183 tkm	0.10	203,653	203,653
 Road Freight: Articulated HGV. Unknown size. 50% Load		0.10	0.10	203,653
 Ductile Iron Pipe transport	11,738.4 tkm	0.10	1,143	1,143
 Road Freight: Articulated HGV. Unknown size. 50% Load		0.10	0.10	1,143
 Embankment		46,412,661	46,412,661	46,412,661

Name	Quantity	kgCO ₂ e		
		Single	Total	Project
 Material transport	476,809,754.4 tkm	0.10	46,412,661	46,412,661
 Road Freight: Articulated HGV. Unknown size. 50% Load		0.10	0.10	46,412,661
 Access Road		204,125	204,125	204,125
 Car Park		49,488	49,488	49,488
 Material Transport	508,400 tkm	0.10	49,488	49,488
 Road Freight: Articulated HGV. Unknown size. 50% Load		0.10	0.10	49,488
 South Access		72,429	72,429	72,429
 Material Transport	744,087.5 tkm	0.10	72,429	72,429
 Road Freight: Articulated HGV. Unknown size. 50% Load		0.10	0.10	72,429
 North Access		82,208	82,208	82,208
 Granular fill transport	728,850 tkm	0.10	70,946	70,946
 Road Freight: Articulated HGV. Unknown size. 50% Load		0.10	0.10	70,946
 Asphalt transport	115,693.5 tkm	0.10	11,262	11,262
 Road Freight: Articulated HGV. Unknown size. 50% Load		0.10	0.10	11,262
 Construction Processes (A5)		128,713	128,713	128,713
 Embankment		0	0	0
 Access Road		128,713	128,713	128,713
 Car Park		56,934	56,934	56,934
 Earthwork cut (waste)	5,299.6 tonne	1.0	5,348	5,348
 Waste - Construction - Aggregates		1.0	1.0	5,348
 Earthwork cut (waste) transport	529,960 tkm	0.10	51,586	51,586
 Road Freight: Articulated HGV. Unknown size. 50% Load		0.10	0.10	51,586
 South Access		45,980	45,980	45,980

Name	Quantity	kgCO ₂ e		
		Single	Total	Project
 Earthworks cut (waste)	4,280 tonne	1.0	4,319	4,319
 Waste - Construction - Aggregates		1.0	1.0	4,319
 Earthworks cut (waste) transport	428,000 tkm	0.10	41,662	41,662
 Road Freight: Articulated HGV. Unknown size. 50% Load		0.10	0.10	41,662
 North Access		25,798	25,798	25,798
 Earthworks cut (waste)	2,401.4 tonne	1.0	2,423	2,423
 Waste - Construction - Aggregates		1.0	1.0	2,423
 Earthworks cut (waste) transport	240,140 tkm	0.10	23,375	23,375
 Road Freight: Articulated HGV. Unknown size. 50% Load		0.10	0.10	23,375
 Pipeline		3,971,528	3,971,528	3,971,528
 Product Stage (A1-3)		3,088,684	3,088,684	3,088,684
 Pipeline		3,088,684	3,088,684	3,088,684
 Ductile Iron Pipe	1,131,500 kg	2.0	2,296,945	2,296,945
 Iron - General		2.0	2.0	2,296,945
 Imported Type 1 backfill material	76,667,443 kg	0.01	398,671	398,671
 Aggregate - General		0.01	0.01	398,671
 Wearing course and tarmac	1 kg	99,590	99,590	99,590
 Asphalt	1,310,400 kg	0.08	99,590	99,590
 Sub-base (cement bound granular material)	1,842,750 kg	0.14	263,513	263,513
 Concrete - 1:1.5:3 Cement:Sand:Aggregate - Average UK Additions		0.14	0.14	263,513
 Topsoil	1,248,530 kg	0.02	29,965	29,965
 Soil - General (Rammed Soil)		0.02	0.02	29,965
 Transport (A4)		800,141	800,141	800,141

Name	Quantity	kgCO ₂ e		
		Single	Total	Project
 Pipeline		800,141	800,141	800,141
 Ductile iron pipe transport	113,150 tkm	0.10	11,014	11,014
 Road Freight: Articulated HGV. Unknown size. 50% Load		0.10	0.10	11,014
 Imported Type 1 backfill material transport	7,666,744 tkm	0.10	746,281	746,281
 Road Freight: Articulated HGV. Unknown size. 50% Load		0.10	0.10	746,281
 Material (tarmac, sub-base granular material, top soil) transport	440,168 tkm	0.10	42,846	42,846
 Road Freight: Articulated HGV. Unknown size. 50% Load		0.10	0.10	42,846
 Construction Processes (A5)		82,704	82,704	82,704
 Excavation waste	7,698.297 tonnes	1.0	7,768	7,768
 Waste - Construction - Aggregates		1.0	1.0	7,768
 Excavation waste transport	769,829.6665 tkm	0.10	74,935	74,935
 Road Freight: Articulated HGV. Unknown size. 50% Load		0.10	0.10	74,935

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